Complete Summary

GUIDELINE TITLE

Glomerulonephritis.

BIBLIOGRAPHIC SOURCE(S)

Singapore Ministry of Health. Glomerulonephritis. Singapore: Singapore Ministry of Health; 2001 Oct. 132 p. [259 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Glomerulonephritis

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Risk Assessment
Treatment

CLINICAL SPECIALTY

Family Practice
Internal Medicine
Nephrology
Pediatrics

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To provide a practical approach to the management of glomerular disease for all doctors

TARGET POPULATION

Adults and children presenting with symptoms of glomerular disease

INTERVENTIONS AND PRACTICES CONSIDERED

Management of Haematuria -- Diagnostic Assessment

1. Urinalysis
2. Detailed history including description of urinary symptoms, recent medical history, past medical history, drug history and family history
3. Physical examination including blood pressure measurement, skin examination for purpura, digital vasculitis, throat/ tonsil inspection, cardiac auscultation for murmurs, signs of pulmonary and peripheral fluid overload, abdominal examination for enlarged, ballotable kidneys or other organomegaly, digital rectal examination of the prostate in males
4. Laboratory evaluation including full blood count, renal function test, urine culture and urine phase contrast microscopy
5. Nephrological referral, as required
6. Imaging studies, including intravenous urography, ultrasonography, flexible cystourethroscopy

Management of Proteinuria -- Diagnostic Assessment

1. Detailed history including description of urinary symptoms, past medical history and drug history
2. Physical examination including blood pressure, signs of end organ damage due to hypertension, signs of renal failure, oedema
3. Laboratory evaluation including urinalysis; urine culture; serum urea, electrolyte, creatinine and fasting glucose; 24 hour urine collection for quantification (24 hour total urinary protein) OR random or spot urinary protein and creatinine measurement
4. Nephrological evaluation including ultrasound of the kidneys; urine phase contrast microscopy; 24 hour urinary creatinine clearance (cyclosporine challenge test [CCT])
5. Renal biopsy

Management of Glomerular Disease -- General Measures

1. Treatment of oedema with diuretics and potassium supplementation
2. Blood pressure management: establishing target blood pressures and treatment of hypertension with angiotensin-converting enzyme inhibitor therapy (e.g., ramipril, enalapril, captopril) or angiotensin II receptor

antagonists (e.g., losartan, irbesartan) (Note: calcium channel blockers are considered but not recommended)
3. Low protein diets
4. Lipid-lowering therapy, such as lovastatin and clofibrate

Specific Management Measures (Dependent on the Type and Degree of Histological Changes)

1. Immunosuppressive therapies including corticosteroids (e.g., high-dose prednisone, prednisolone, methylprednisolone), alkylating agents (e.g., cyclophosphamide, chlorambucil), other cytotoxics (e.g., azathioprine, mizoribine), levamisole, and cyclosporin A
2. Symptomatic therapy for patients with non-nephrotic proteinuria
3. Monitoring of haematuria and proteinuria
4. Angiotensin converting enzyme (ACE) inhibitors and angiotensin II receptor antagonists (ATRA)
5. Antithrombotics, such as dipyridamole, warfarin, and aspirin therapy
6. Dietary supplementation with fish oil
7. Intravenous immunoglobulin
8. Plasma exchange (plasmapheresis)
9. Non immunosuppressive options such as phenytoin, danazol, a gluten-free diet, tonsillectomy, sodium cromoglycate and urokinase (considered but not recommended)
10. Renal biopsy
11. Dialysis
12. Evaluation to rule out autoimmune causes, infections, drugs and malignancies

MAJOR OUTCOMES CONSIDERED

- Progression of renal disease as measured by degree of proteinuria and other renal function tests
- Blood pressure control
- Renal survival
- Rates of complete and partial remission
- Mean time to achieve remission and duration of remission
- Relapse rates
- Incidence of adverse drug effects
- Rates of steroid dependence and steroid resistance

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Guidelines were developed after a review of the available literature to June 2001 was completed and the recommendations were adapted to local practice.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Levels of Evidence

Level Ia: Evidence obtained from meta-analysis of randomised controlled trials.

Level Ib: Evidence obtained from at least one randomised controlled trial.

Level IIa: Evidence obtained from at least one well-designed controlled study without randomisation.

Level IIb: Evidence obtained from at least one other type of well-designed quasi-experimental study.

Level III: Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.

Level IV: Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities.

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

When evidence for therapy was available, the consensus opinion of the members of the workgroup was accepted as recommendations for best clinical practice.

While every effort has been made to provide the best available evidence in the treatment of glomerular disease, local practice was also taken into consideration when arriving at the recommendations.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Grades of Recommendation

Grade A (evidence levels Ia, Ib): Requires at least one randomized controlled trial as part of the body of literature of overall good quality and consistency addressing the specific recommendation.

Grade B (evidence levels IIa, IIb, III): Requires availability of well conducted clinical studies but no randomised clinical trials on the topic of recommendation.

Grade C (evidence level IV): Requires evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates absence of directly applicable clinical studies of good quality.

Good Practice Points: Recommended best practice based on the clinical experience of the guideline development group.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Not stated

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Each recommendation is rated based on the level of the evidence and the grades of recommendation. Definitions of the grades of the recommendations (A, B, C, Good Practice Points) and level of the evidence (Level I- Level IV) are presented at the end of the Major Recommendations field.

Management of Haematuria and Proteinuria

B - Patients with microscopic haematuria ($\geq$5 red blood cells/high-power field [RBCs/hpf]) should be evaluated to exclude renal/urinary tract disease. (Grade B, Level III)

B - Urine phase contrast microscopy under standard conditions is recommended to differentiate glomerular from non-glomerular sources of haematuria. (Grade B, Level III)

B - Patients with isolated asymptomatic microhaematuria should remain on follow-up at 6 to 12 month intervals to monitor renal function and blood pressure. (Grade B, Level III)

B - Asymptomatic microhaematuria <5 red blood cells/high-power field in patients <40 years of age does not require full urological evaluation in the absence of other clinical features of malignancy. (Grade B, Level III)

B - Patients with orthostatic proteinuria have a good renal prognosis and do not require follow- up. (Grade B, Level III)

B - Patients with intermittent isolated proteinuria have a favourable renal prognosis but should still be followed up six monthly until its resolution. (Grade B, Level III)

B - Patients with persistent isolated proteinuria should be followed-up indefinitely with monitoring of the blood pressure and renal function since the risk of subsequently developing renal insufficiency is higher. (Grade B, Level III)

B - Patients with persistent proteinuria $\geq$1 g/day have adverse renal histopathology and therefore worse ultimate renal prognosis and should undergo renal biopsy. (Grade B, Level III)

B - Patients with microhaematuria and proteinuria, especially in the presence of red cell casts, hypertension and/ or renal insufficiency should be referred for further nephrological assessment. (Grade B, Level III)

B - All patients with gross haematuria should be evaluated for urological pathology with a combination of ultrasound, intravenous urography and flexible cystourethroscopy. (Grade B, Level III)

Management of Glomerular Disease – General Measures

B - Hypertension defined as blood pressure $\geq$140/90 mmHg in patients with renal disease should be treated in order to retard the rate of deterioration of renal function. (Grade B, Level IIb)

B - A target blood pressure <125/75 mmHg (Mean arterial pressure <92 mmHg) is recommended for patients with serum creatinine <600 micromol/L and total urinary protein excretion $\geq$1 g/day. (Grade B, Level III)

C - A target blood pressure <130/ 80 mmHg (mean arterial pressure <98 mmHg) is recommended for patients with serum creatinine <600 micromol/L and total urinary protein excretion <1 g/day. (Grade C, Level IV)

A - Angiotensin converting enzyme inhibitor therapy is preferable to conventional therapy for treatment of hypertension in patients with glomerulonephritis as it confers greater renoprotection. (Grade A, Level Ib)

B - Angiotensin converting enzyme inhibitor therapy is preferable to calcium channel blockers for treatment of hypertension in patients with glomerulonephritis as it confers greater renoprotection. (Grade B, Level III)

B - Angiotensin II receptor antagonists can be used as an alternative to angiotensin converting enzyme inhibitors to treat hypertension in patients with glomerulonephritis. (Grade B, Level III)

GPP - Angiotensin converting enzyme inhibitors or angiotensin II receptor antagonists can be used to reduce proteinuria in patients with glomerulonephritis in the absence of hypertension.

GPP - For patients with serum creatinine levels >265 micromol/L, angiotensin converting enzyme inhibitors and angiotensin II receptor antagonists should be used with particular caution, with regular monitoring of serum creatinine and potassium.

A - Patients with severe renal insufficiency (serum creatinine >350 micromol/L) should be considered for treatment with low protein diets. However, low protein diets should be used judiciously so as to avoid malnutrition and its potential adverse effects. (Grade A, Level Ia)

A - Lipid-lowering therapy does not confer renoprotection in patients with glomerular disease. (Grade A, Level Ib)

C - Lipid-lowering therapy is recommended for cardiovascular benefit in patients with glomerular disease. (Grade C, Level IV)

Minimal Change Disease

A - High dose prednisolone is recommended for initial treatment of nephrotic syndrome due to minimal change disease. (Grade A, Level Ib)

A - Prednisolone dose should be tapered after remission in nephrotic syndrome is achieved and subsequently discontinued. (Grade A, Level Ib)

B - Cytotoxic therapy with cyclophosphamide can be used in the treatment of frequently relapsing, steroid dependent or steroid resistant nephrotic syndrome due to minimal change disease. (Grade B, Level III)

GPP - Patients in whom cyclophosphamide therapy is planned should be informed of the potential risk for sterility; male patients should be advised to consider sperm storage.

A - Cyclosporin A can be used in the treatment of frequently relapsing, steroid dependent or steroid resistant nephrotic syndrome due to minimal change disease. (Grade A, Level Ib)

B - Patients on cyclosporin A therapy for treatment of nephrotic syndrome due to minimal change disease should have periodic monitoring of renal function. A

repeat renal biopsy should be considered after a year of cyclosporin A therapy to detect histological evidence of nephrotoxicity. (Grade B, Level III)

Focal and Segmental Glomerulosclerosis

B - High dose prednisolone should be given as first line therapy for treatment of nephrotic syndrome due to focal and segmental glomerulosclerosis. Prednisolone dose should be tapered slowly after remission is achieved and total treatment duration should be for at least 6 months. (Grade B, Level III)

B - Cytotoxic therapy with cyclophosphamide should be considered for patients with steroid dependent nephrotic syndrome due to focal and segmental glomerulosclerosis, or those with steroid-related side effects. (Grade B, Level III)

B - Cytotoxic therapy may be considered as alternative therapy in patients with steroid resistant nephrotic syndrome due to focal and segmental glomerulosclerosis. (Grade B, Level III)

GPP - Patients in whom cyclophosphamide therapy is planned should be informed of the potential risk for sterility; male patients should be advised to consider sperm storage.

A - Cyclosporin A at starting doses of 3 to 5 mg/kg/day should be considered for patients with steroid-resistant nephrotic syndrome due to focal and segmental glomerulosclerosis. As a lasting remission may not be achieved, long-term use may be necessary to maintain remission. (Grade A, Level Ib)

C - There is no firm evidence for benefit from other therapies in the treatment of nephrotic syndrome due to focal and segmental glomerulosclerosis. (Grade C, Level IV)

Immunoglobulin A (IgA) Nephropathy

C - No therapy is recommended for patients with immunoglobulin A nephropathy and isolated haematuria without proteinuria. These patients should be monitored regularly (every 3 to 12 months) for the development of proteinuria. (Grade C, Level IV)

C - No therapy is recommended for patients with immunoglobulin A nephropathy and asymptomatic haematuria with proteinuria of 0.15 g/day to 1 g/day and no other adverse clinical or histological indicators. Proteinuria should be monitored at 3 to 12 month intervals. (Grade C, Level IV)

A - Angiotensin converting enzyme inhibitor therapy is recommended for treatment of hypertension in patients with immunoglobulin A nephropathy. (Grade A, Level Ib)

A - Angiotensin converting enzyme inhibitor therapy is recommended in normotensive patients with immunoglobulin A nephropathy and proteinuria $\geq$1 g/day. (Grade A, Level Ib)

B - Angiotensin II receptor antagonists can be used as alternatives to angiotensin converting enzyme inhibitors in patients with immunoglobulin A nephropathy for similar indications. (Grade B, Level IIa)

B - Angiotensin converting enzyme inhibitors and angiotensin II receptor antagonists can be used in combination to reduce proteinuria in patients with immunoglobulin A nephropathy and proteinuria $\geq$1 g/day. (Grade B, Level IIb)

A - Dipyridamole and low- dose warfarin combination therapy is recommended for patients with immunoglobulin A nephropathy and proteinuria $\geq$1 g/day. Its use is not contraindicated in patients with abnormal renal function. (Grade A, Level Ib)

A - Fish oil supplementation is not beneficial in every patient with immunoglobulin A nephropathy. (Grade A, Level Ia)

C - Fish oil supplementation can be used in patients with immunoglobulin A nephropathy and proteinuria >3 g/day. (Grade C, Level IV)

B - Nephrotic patients with immunoglobulin A nephropathy and mild histological changes on renal biopsy should be treated with prednisolone at an initial dose of 1 mg/kg/day with subsequent tapering after 4 to 6 weeks for a total treatment period of 3 to 4 months. (Grade B, Level IIb)

B - Nephrotic patients with immunoglobulin A nephropathy and mild histological changes who have relapses, steroid resistance or steroid dependence should be treated with cyclophosphamide at a dose of 1.5 to 2.0 mg/kg/day for 2 to 3 months together with low dose prednisolone. (Grade B, Level IIa)

C - Cyclosporin A at an initial dose of 5 mg/kg/day can be initiated in nephrotic immunoglobulin A patients with mild histological changes who fail steroid and cyclophosphamide therapy. The recommended treatment period is 6 to 12 months and low dose prednisolone should be given concomitantly. (Grade C, Level IV)

C - Nephrotic immunoglobulin A patients with histological changes that are not mild can be treated with prednisolone, cyclophosphamide or Cyclosporin A, similar to those with mild histological changes. (Grade C, Level IV)

GPP - However, response to therapy in these patients is less favourable and over-immunosuppression should be avoided in non-responders.

C - Standard treatment as for other forms of crescenteric glomerulonephritis is recommended for patients with acute renal failure due to crescenteric immunoglobulin A nephropathy. Treatment with methylprednisolone pulse should be followed by oral prednisolone, cyclophosphamide, dipyridamole and warfarin. Plasma exchange and intravenous immunoglobulins can be instituted. (Grade C, Level IV)

C - No specific treatment is recommended for patients with immunoglobulin A nephropathy and acute renal failure in the presence of mild glomerular changes. (Grade C, Level IV)

GPP - No specific treatment is recommended in treatment of recurrent immunoglobulin A nephropathy post renal transplantation. Treatment options are similar to the de novo disease.

Membranous Nephropathy

C - Patients with membranous nephropathy should undergo evaluation to identify secondary causes. Specifically, evaluation should be performed to exclude secondary causes such as autoimmune conditions, infections, drugs and malignancies. (Grade C, Level IV)

B - Patients with idiopathic membranous nephropathy and nephrotic syndrome or Stage III or IV disease on histology should be treated with immunosuppressive therapy as they are at risk for progression to end stage renal failure. (Grade B, Level IIb)

B - There is no evidence for benefit with immunosuppressive therapy for those with sub- nephrotic range proteinuria, normal renal function or Stage I or II disease on renal biopsy. (Grade B, Level IIb)

B - Patients with idiopathic membranous nephropathy and progressive renal dysfunction should be treated with immunosuppressive therapy. (Grade B, Level III)

A - Patients with nephrotic syndrome due to membranous nephropathy may be treated with steroids alone to induce remission of proteinuria. (Grade A, Level Ib)

A - There is no evidence for long-term benefit with steroids in the treatment of patients with membranous nephropathy. (Grade A, Level Ia)

A - Patients with membranous nephropathy at high risk for progression to end stage renal failure can be considered for treatment with alkylating agents, together with steroids, for 6 months. (Grade A, Level Ia)

B - As alkylating agents are associated with drug-related toxicities, patients receiving these agents should be closely monitored during and after therapy. (Grade B, Level III)

A - In patients with membranous nephropathy and renal dysfunction, daily oral cyclophosphamide for 12 months, together with steroids, should be considered to prevent renal failure. (Grade A, Level Ib)

A - Patients with membranous nephropathy at high risk for progression to end stage renal failure should be treated with 6 months of cyclosporin A and steroids. (Grade A, Level Ib)

A - Patients with membranous nephropathy and progressive renal dysfunction should be treated with 12 months of cyclosporin A. (Grade A, Level Ib)

Rapidly Progressive Glomerulonephritis

AGrade A, Level Ib)

C - Corticosteroid therapy in rapidly progressive glomerulonephritis due to anti-glomerular basement membrane antibody should be with pulse methylprednisolone followed by oral prednisolone. (Grade C, Level IV)

A - Daily plasma exchange with 4-L exchanges is recommended in rapidly progressive glomerulonephritis due to anti- glomerular basement membrane antibodies for 14 days or until the antibody disappears. (Grade A, Level Ib)

B - Methylprednisolone pulse therapy followed thereafter by oral prednisolone at 1 mg/kg/day is recommended for treatment of pauci-immune rapidly progressive glomerulonephritis. (Grade B, Level IIa)

B - Cyclophosphamide can be given orally or by monthly intravenous pulse for treatment of pauci- immune rapidly progressive glomerulonephritis. (Grade B, Level IIa)

B - Plasmapheresis should be considered for patients with pulmonary hemorrhage and in those with pauci-immune, rapidly progressive glomerulonephritis and severe renal disease who do not respond to conventional therapy. (Grade B, Level III)

B - Rapidly progressive glomerulonephritis due to Wegener´s granulomatosis can be treated with either oral or intravenous cyclophosphamide. (Grade B, Level IIa)

B - High dose corticosteroids, either oral or pulse therapy, should be used to treat rapidly progressive glomerulonephritis due to Wegener´s granulomatosis. (Grade B, Level IIa)

B - Plasmapheresis is not likely to be beneficial in patients with rapidly progressive glomerulonephritis due to Wegener´s granulomatosis. (Grade B, Level III)

Mesangiocapillary Glomerulonephritis

B - Treatment is recommended for adults and children with idiopathic mesangiocapillary glomerulonephritis and heavy proteinuria, tubulointerstitial disease on renal biopsy or impaired renal function. (Grade B, Level III)

A - Children with Type I mesangiocapillary glomerulonephritis at high risk for progression to renal failure should be treated with high dose corticosteroids. (Grade A, Level Ib)

B - Children with Type II mesangiocapillary glomerulonephritis at high risk for progression to renal failure can be treated with high dose corticosteroids. (Grade B, Level III)

B - There is no evidence of benefit with corticosteroids for therapy in adults with mesangiocapillary glomerulonephritis. (Grade B, Level III)

A - Cytotoxic therapy is not recommended for the treatment of idiopathic mesangiocapillary glomerulonephritis. (Grade A, Level Ib)

B - Dipyridamole and aspirin are recommended for treatment of idiopathic mesangiocapillary glomerulonephritis in adults at high risk for progression to renal failure. (Grade B, Level III)

Management of Childhood Nephrotic Syndrome

A - Children experiencing their first episode of nephrotic syndrome should be treated with prednisolone at 60 mg/m^2/day (maximum of 80 mg/day) for 4 weeks followed by 40 mg/m^2 of prednisolone every alternate day for 4 weeks and gradual taper over 4 weeks. (Grade A, Level Ia)

A - Prednisolone should be given as a single morning dose in treating children with nephrotic syndrome. (Grade A, Level Ib)

A - Children with a relapse of nephrotic syndrome should be treated with prednisolone at 60 mg/m^2/day (maximum of 80 mg/day) (minimum 14 days) until urine is protein free for 3 consecutive days. This should be followed by alternate-day prednisolone of 40 mg/m^2 for 4 weeks, after which prednisolone should be gradually tapered over 4 weeks. (Grade A, Level Ib)

C - Children with frequently relapsing nephrotic syndrome can receive relapse therapy during relapses and be maintained on prednisolone 0.1 to 0.5 mg/kg/alternate days for 3 to 6 months. (Grade C, Level IV)

B - A 6 to 12 month course of Levamisole at 2.5 mg/kg/alternate days can be used for treatment of frequently relapsing nephrotic syndrome in children. (Grade B, Level IIa)

A - Cyclophosphamide at 2 to 2.5 mg/kg/day or chlorambucil at 0.15 mg/kg/day for 8 weeks can be used for the treatment of a relapse of nephrotic syndrome in children with frequent relapses. (Grade A, Level Ia)

GPP - For children with steroid dependent nephrotic syndrome, a repeat course of relapse therapy with prednisolone and alternate-day prednisolone 0.1 to 0.5 mg/kg/alternate days for 6 to 12 months can be administered.

A - Levamisole at 2.5 mg/kg/alternate days for 6 to 12 months should be given for children with steroid dependent nephrotic syndrome as for children with the frequently relapsing condition. (Grade A, Level Ib)

B - Children with steroid dependent nephrotic syndrome can be treated with cyclophosphamide at 2 to 2.5 mg/kg/day or chlorambucil at 0.15 mg/kg/day for 8 to 12 weeks. (Grade B, Level III)

A - Cyclosporin A at 6 mg/kg/day should be administered to children with steroid dependent nephrotic syndrome. (Grade A, Level Ib)

C - Cyclosporin A therapy can be given for one year in the treatment of steroid dependent nephrotic syndrome. (Grade C, Level IV)

C - Renal biopsy is recommended in children with steroid resistant nephrotic syndrome to rule out other glomerular pathology. (Grade C, Level IV)

C - Treatment for hyperlipidaemia, symptomatic treatment of severe oedema with diuretics and intravenous albumin is recommended for children with steroid resistant nephrotic syndrome. (Grade C, Level IV)

C - Cyclophosphamide 2 to 2.5 mg/kg/day for 12 weeks can be used for treatment of steroid resistant minimal change nephrotic syndrome in children. (Grade C, Level IV)

B - Cyclosporin A 6 mg/kg/day can be used for treatment of childhood steroid resistant nephrotic syndrome. (Grade B, Level III)

GPP - Cyclosporin A therapy can be given for 2 years in the treatment of childhood steroid resistant nephrotic syndrome.

Definitions:

Grades of Recommendations

Grade A (evidence levels Ia, Ib): Requires at least one randomised controlled trial as part of the body of literature of overall good quality and consistency addressing the specific recommendation.

Grade B (evidence levels IIa, IIb, III): Requires availability of well conducted clinical studies but no randomised clinical trials on the topic of recommendation.

Grade C (evidence level IV): Requires evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates absence of directly applicable clinical studies of good quality.

Good Practice Points: Recommended best practice based on the clinical experience of the guideline development group.

Levels of Evidence

Level Ia: Evidence obtained from meta-analysis of randomised controlled trials.

Level Ib: Evidence obtained from at least one randomised controlled trial.

Level IIa: Evidence obtained from at least one well-designed controlled study without randomisation.

Level IIb: Evidence obtained from at least one other type of well-designed quasi-experimental study.

Level III: Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.

Level IV: Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities.

CLINICAL ALGORITHM(S)

The original guideline contains four clinical algorithms:

- Approach to Haematuria
- Approach to Proteinuria
- Management of Membranous Nephropathy
- Management of Childhood Nephrotic Syndrome

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations"). When evidence for therapy was not available, the consensus opinion of the members of the workgroup was accepted as recommendations for best clinical practice.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Early and appropriate detection and management of glomerular disease may result in a reduction in renal failure due to glomerulonephritis in Singapore and a shift in the pattern of renal failure.

POTENTIAL HARMS

Lipid-lowering Therapy

- There are concerns about the toxicity of lipid-lowering drugs as clofibrate has been associated with toxicity in patients with reduced renal function.
- The use of a combination of lipid-lowering drugs and cyclosporine in renal transplants has resulted in muscle toxicity and acute renal failure.

Steroids

- Prolonged steroid use is associated with a high risk of steroid side effects such as growth retardation, cataracts and obesity. Alternate-day prednisolone is associated with lower risk of steroid toxicity.

Cyclophosphamide

- Leukopenia is a potential risk, and leukocyte counts need to be monitored.
- There is also a potential risk for sterility. Cyclophosphamide is associated with an increased risk of gonadal toxicity with a cumulative dose of 200 mg/kg, and most cases of late malignancy occur in patients treated for more than a year.

Chlorambucil

- Chlorambucil has a higher rate of severe side effects than cyclophosphamide.

Cyclosporin A

- Nephrotoxicity has been the major complication in the use of cyclosporin A. The serum creatinine can remain normal despite histological changes in the kidney.

Subgroups Most Likely to Be Harmed:

Initiation of angiotensin-converting enzyme (ACE) inhibitor or angiotensin II receptor antagonist (ATRA) therapy should be postponed in patients with hypovolemia or hyperkalemia until the conditions are corrected and is contraindicated in patients with renal artery stenosis. Caution should be exercised when initiating and maintaining these drugs in patients with abnormal renal function as hyperkalemia and acute deterioration of renal function (in patients with undetected renal artery stenosis) can ensue.

CONTRAINDICATIONS

CONTRAINDICATIONS

Initiation of angiotensin-converting enzyme (ACE) inhibitor or angiotensin II receptor antagonist (ATRA) therapy is contraindicated in patients with renal artery stenosis.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

These guidelines are not intended to serve as a standard of medical care. Standards of medical care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge advances and patterns of care evolve.

The contents of this publication are guidelines to clinical practice, based on the best available evidence at the time of development. Adherence to these guidelines may not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care. Each physician is ultimately responsible for the management of his/her unique patient in the light of the clinical data presented by the patient and the diagnostic and treatment options available.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

The success of the implementation of these guidelines can be evaluated by monitoring various parameters associated with the condition:

- Numbers of new referrals to nephrologists for proteinuria $\geq$1 g/day
- Renal function, presence of hypertension and level of proteinuria at the time of referral for these patients
- Numbers of renal biopsies performed annually by nephrologists
- Pattern of glomerulonephritis in Singapore as obtained from renal biopsies

In addition to prevalence and pattern of disease, outcome of interventions should be evaluated to determine the impact of implementation of evidence-based guidelines. These include:

- Blood pressure, renal function and proteinuria following optimal management of high-risk patients with glomerulonephritis
- Incidence of new end stage renal failure (ESRD) due to glomerulonephritis in Singapore

Ideal management of glomerulonephritis will result in reduction in level of proteinuria, stabilisation or improvement of renal function and excellent control of blood pressure. Thus, percent of patients with >50% reduction in proteinuria, the rate of deterioration of renal function and percent of patients with blood pressure below 130/80 mmHg should be monitored as parameters of efficacy of these guidelines.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Singapore Ministry of Health. Glomerulonephritis. Singapore: Singapore Ministry of Health; 2001 Oct. 132 p. [259 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 Oct

GUIDELINE DEVELOPER(S)

National Committee on Renal Care (Singapore)
National Medical Research Council (Singapore Ministry of Health) - National Government Agency [Non-U.S.]
Singapore Ministry of Health - National Government Agency [Non-U.S.]

GUIDELINE DEVELOPER COMMENT

These guidelines were developed by an expert workgroup appointed by the National Committee on Renal Care.

SOURCE(S) OF FUNDING

Singapore Ministry of Health (MOH)

GUIDELINE COMMITTEE

National Committee on Renal Care

Workgroup on Glomerulonephritis

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Workgroup Members: Prof Woo Keng Thye (Chairperson); Dr A Vathsala (Co-Chairman); Dr Stephen Chew Tec Huan; Dr Lina Choong Hui Lin; Dr Gong Wei Kin; Prof Evan J C Lee; Dr Grace Lee; Dr Tan Han Khim; Dr Wong Kok Seng; Dr Akira Wu; Prof Yap Hui Kim; Dr Benjamin Koh Khay Wee; Dr Gary Ong PangYeow

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the Singapore Ministry of Health Web site.

Print copies: Available from the Singapore Ministry of Health, College of Medicine Building, Mezzanine Floor 16 College Rd, Singapore 169854.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on January 8, 2002. The information was verified by the guideline developer on February 22, 2002.

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